



Innovation in Defense Acquisition Oversight: An Exploration of the AT&L Acquisition Visibility SOA

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Russell Vogel

Acquisition Resource and Analysis
Office of the Under Secretary of Defense for
Acquisition, Technology and Logistics
(703) 845-6677
Russell.Vogel@osd.mil

Robert M. Flowe

Acquisition Visibility – Service Oriented
Architecture (AV SOA)
Office of the Under Secretary of Defense for
Acquisition, Technology and Logistics
(703) 699-0183
Robert.Flowe@osd.mil

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Agenda

- ▶ Acquisition Visibility Purpose
- ▶ Project History – AT&L AV SOA
- ▶ Architecture
- ▶ Data Elements and Programs included to date
- ▶ Implications for Academic Research



Acquisition Visibility

- ▶ The Department of Defense and others have noted deficiencies in the Department's ability to manage its \$1.6T portfolio of Major Defense Acquisition Programs.
- ▶ Undersecretary of Defense for Acquisition Technology & Logistics is addressing these deficiencies by focusing on Acquisition Visibility (AV)

Acquisition Visibility

Timely access to accurate, authoritative, and reliable information supporting acquisition oversight, accountability, and decision making throughout the Department for effective and efficient delivery of warfighter capabilities



Project History – AT&L AV SOA

- ▶ **Demo:** February 2008 demonstration of data governance and Service Oriented Architecture to support major weapons system decision making. Completed in ~45 days.
 - Included 61 data elements (Earned Value Management and Unit Cost) for 12 Major Defense Acquisition Programs (MDAPs)—4 from each Military Service
- ▶ **Pilot:** 2008-2009 pilot to solidify governance and technical approach.
 - In December 2008, provided acquisition oversight decision-making information for 37 MDAPs, totaling ~\$1.2T in program value, ~75% of the FYDP.
 - In fall 2009, provided 103 MDAPs and other major programs totaling ~\$1.6T
 - ~148 data elements (Earned Value Management, Program Administration, Unit Cost, Science and Technology, Milestones, Budget/Current Estimate)



AT&L AV SOA – Full Implementation Approval

March 5, 2009

THE UNDER SECRETARY OF DEFENSE
3010 DEFENSE PENTAGON
WASHINGTON, DC 20301-3010

MAIL TO: [REDACTED]

MEMORANDUM FOR SERVICE ACQUISITION EXECUTIVES

SUBJECT: Full Implementation of Acquisition Visibility (AV) Service Oriented Architecture (SOA) within DoD Acquisition Community

In my July 25, 2008 memorandum I direct the capability of the Acquisition Visibility Service to capture and publish authoritative data for a set of the MDAP funding over the FYDP. With your initial operational capability, Pilot users from each office are already registered and testing the capability. All DoD acquisition personnel may establish capability.

We have also re-plumbed the workings of management tools — DAMIR and Kaleidoscope access this new and useful data source. An add-in to users' desktop for use by any means desired is covers 37 of our largest MDAPs, and more will be included in time to support the FY2011 program.

I am now directing we put in place all the provide "acquisition data as a service" to the enterprise must be flexible and scalable enough to pilot covers, in order to expand current data governance to serve other aspects of AT&L operations such as others. Based on lessons learned from the pilot industry, leads me to the following decisions for providing a permanent resource basis:

Governance Forum. The Weapon System Steering Group (WSLM SSG) is assigned the formal data governance decisions related to: (1) formal acquisition-related management systems, (2) the standards for making these data visible, and (3) a source of any individual data element.

Resources. For the balance of FY09, resources will be provided from within existing Defense-Wide funds. Going forward, I expect the costs of functional data governance to be funded out of the resources from each of the functional areas, but the cost of the SOA infrastructure requires a permanent basis. SOA infrastructure costs amount to approximately \$14 million annually, and I direct each of the Services to identify and make available \$4.7 million per year over the FYDP to be transferred to AT&L to support this infrastructure. My staff will work to make these transfers through appropriate processes as soon as practicable.

By implementing AV SOA as a durable institution, we will be providing the DoD acquisition community critical management insight that the commercial world achieved a generation ago: timely, coherent data that is reliably and transparently available throughout the acquisition enterprise. The continued cooperation of your organizations is paramount to this success. Careful data governance will not only lower our overall costs, it will prompt faster, better, acquisition decisions.

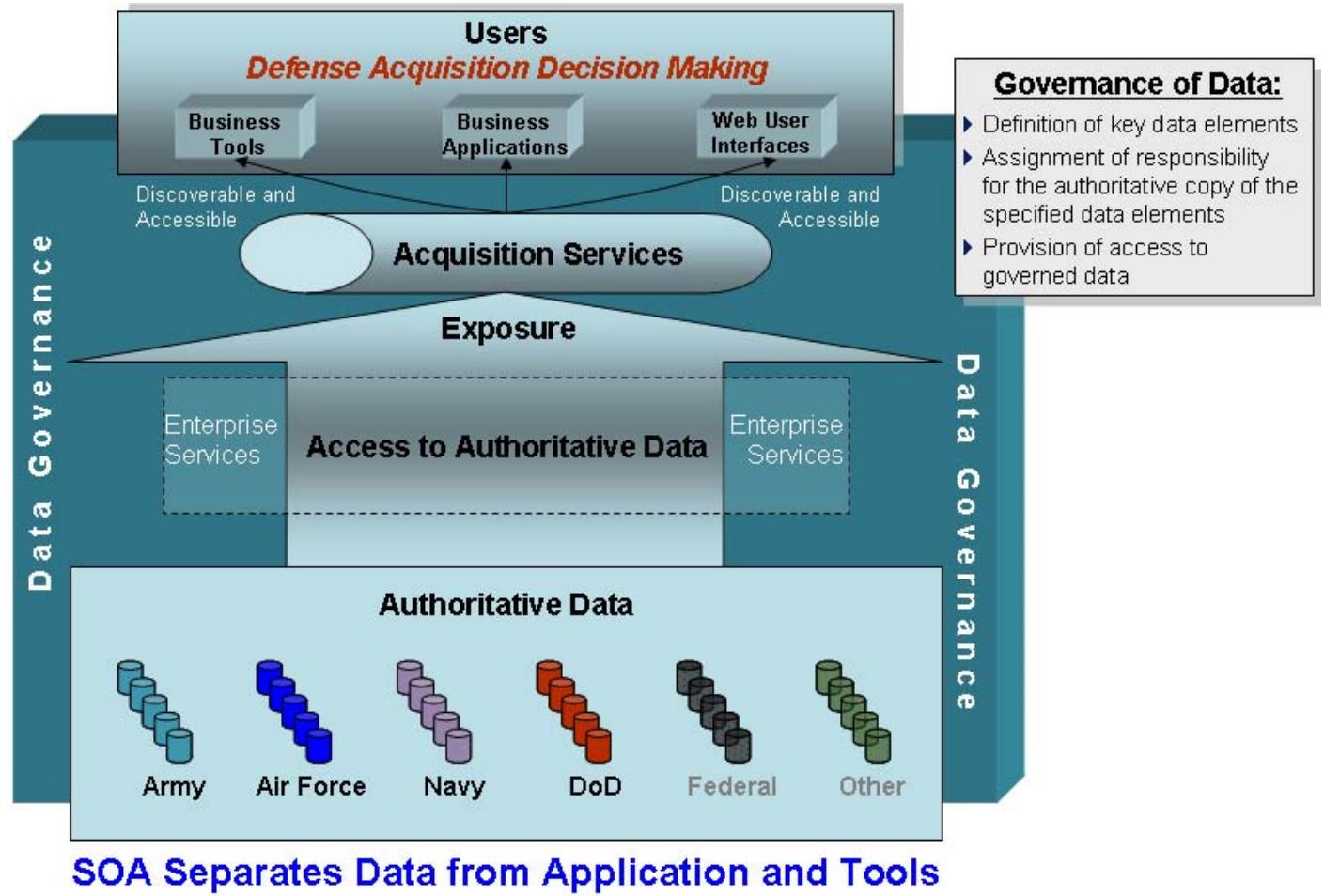
John J. Young, Jr.

- ▶ USD AT&L issued AT&L AV SOA full implementation memo on March 5, 2009
- ▶ Directs AT&L to put in place all the elements of a durable solution to provide "acquisition data as a service" to the entire acquisition community.
 - Full Acquisition community access by June 09
 - All Major Defense Acquisition Programs (MDAPs) in time to support the FY 2011 program/budget review
- ▶ Separates data governance and SOA infrastructure responsibilities
- ▶ Weapon System Lifecycle Management Senior Steering Group to make all formal governance decisions
 - Director of Acquisition Resources and Analysis responsible for functional data governance for MDAP management
 - Other functional business areas to develop functional data governance to meet their decision-making information needs



Defense Acquisition Visibility via SOA

- ▶ **AV SOA Solution:**
Apply Service Oriented Architecture and data governance to create shared services
- ▶ **Results:**
 - Defense acquisition information transparency across the Department
 - Access to up-to-date, reliable data via any authorized application or analysis tool
 - An extensible platform available for Department-wide use



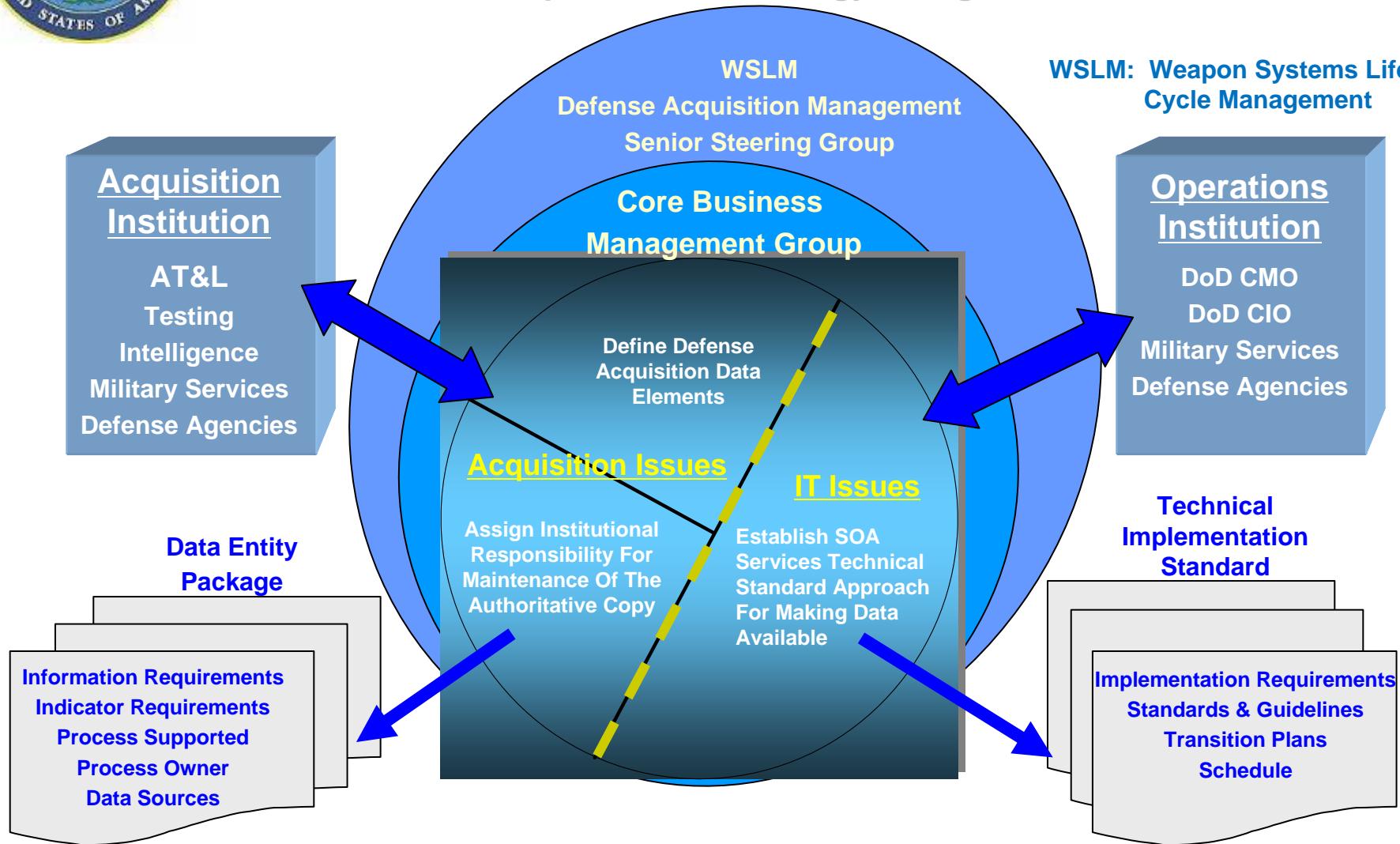
"I reject the idea that the federal government cannot innovate." – Vivek Kundra, Federal CIO



Balancing Functional and Technical Equities

Acquisition Technology & Logistics

WSLM: Weapon Systems Life Cycle Management



Definition of Success

Demonstrating Data Governance

- Define selected Defense acquisition data elements to be exchanged
- Identification of authoritative sources
- Assign institutional responsibility for maintenance of the authoritative copy of each data element within a system

Demonstrating Data Definition Consistency

- Availability of data defined as requested by AT&L
- For the demo, the bar is low: primarily EV- and Nunn-McCurdy-related data

Demonstrating Data Access

- Implementing the SOA infrastructure



AV SOA Data Categories

- ▶ *EVM* – Contract elements included in DAMIR’s “Contract Data Point” and/or reported on the Contract Performance Report (CPR) to track progress
- ▶ *Unit Cost* – Current estimate vs. APB (current and original) at total-appropriation level (RDT&E, Procurement, MILCON, O&M), by fiscal year for comparison, to support risk identification
- ▶ *Budget* – Current President’s Budget and POM/BES submission, by appropriation and fiscal year, for identifying changes in budget positions
- ▶ *Milestone* – Program milestones as agreed upon in the APB, to provide a reference point for tracking progress
- ▶ *Science & Technology* – Compare Key Performance Parameters, thresholds, and objectives to current measurement and to identify critical technologies
- ▶ *Program Administration* – To organize/view information by program, sub-program, budget activity, program element, budget line item, and/or project code



AV SOA Data Elements – 148

Program Administration	Unit Cost (cont'd)
Program Name	Current Estimate - O&M (BY) - Total for all years
Program Number (PNO)	Current Estimate - Development Quantity
Program URI (Uniform Resource Identifier)	Current Estimate - Procurement Quantity
Sub-Program URI	Original Baseline (APB): Development Quantity
Sub-Program Name	Original Baseline (APB): Procurement Quantity
Budget Activity Identifier	Current Baseline (APB): Total RDT&E Cost
PE (Program Element)	Budget
Budget Line Item (formerly Procurement Line Item(PLI))	Original Quantity
PM Management Reserve	Current Quantity
Project Code	Scheduled Quantity
Unit Cost	Delivered Quantity
Current Baseline (APB): Total Procurement Cost	Budget Fiscal Year
Current Baseline (APB): Total MILCON Cost	OTB (Over Target Baseline) - Date
Current Baseline (APB): Total O&M Cost	OTB - BAC Adjustment (\$)
Current Baseline (APB): Total Development Quantity	OTB - SV Adjustment (\$)
Current Baseline (APB): Total Procurement Quantity	OTB - CV Adjustment (\$)
PAUC (Program Acquisition Unit Cost) - Current Estimate	NCC - Original
APUC (Average Procurement Unit Cost) - Current Estimate	NCC (Negotiated Contract Cost) - Current
Estimate Type	Target Price - Current
Base Year - Original APB	Target Price - Original
Base Year - Current APB	Estimated Price - Contractor
Original APB Date	Estimated Price - PM
Current APB Date	Ceiling Price - Current
Program Completion Year	Ceiling Price - Original
Escalation Index	Ceiling Price - Contractor's Estimated
Department Regular Code	Ceiling Price - PMs Estimated
Main Account Code	Completion Date (when BCWS = BAC)
Appropriation FY (Fiscal Year)	TAB (Total Allocated Budget)
Current Estimate - Research, Development, Test & Evaluation (RDT&E) costs	ACWP (Actual Cost of Work Performed)
Current Estimate - Procurement Costs	Current President's Budget RDT&E Submission
Current Estimate - Military Construction (MILCON) Costs	Current President's Budget Procurement Submission
Current Estimate - Operation & Maintenance (O&M) Costs	Current President's Budget MILCON Submission
Current Estimate - Development Quantity	Current President's Budget O&M Submission
Current Estimate - Procurement Quantity	Current President's Budget Development Quantity Submission
Original Baseline (APB): Total RDT&E Cost	Current President's Budget Procurement Quantity Submission
Original Baseline (APB): Total Procurement Cost	RDT&E POM/BES Submission
Original Baseline (APB): MILCON Cost	Procurement POM/BES Submission
Original Baseline (APB): O&M Cost	MILCON POM/BES Submission
Current Estimate - RDT&E (BY) - Total for all years	O&M POM/BES Submission
Current Estimate - Procurement (BY) - Total for all years	POM/BES Development Quantity
Current Estimate - MILCON (BY) - Total for all years	POM/BES Procurement Quantity



AV SOA Data Elements – 148 (cont'd)

Earned Value	Earned Value (cont'd)
Contract Number	BCWS (Budgeted Cost of Work Scheduled)
Contract Modification Identifier	CBB (Contract Budget Base)
Contract Modification Date	EAC - Contractor (Estimate At Completion)
Contract Type Code	EAC - Contractor Best Case
Contractor Name	EAC - PM
Contractor Division	EAC - Contractor Worst Case
CAGE Code (Commercial And Government Entity Code)	MR (Management Reserve)
Contractor Location - City	VAC (Variance At Completion)
Contractor Location - State	% VAC
Contractor Location - Zip Code + 4	PM VAC
Contractor Location - Province	% Complete
Contractor Location - Country	TCPI (To Complete Performance Index)
Contract Award Date	TCPI - CPI
Contract Definitization Date	% Schedule
Contract Effort Number	CPI (Cost Performance Index)
Contract Effort Name	SPI (Schedule Performance Index)
Contract Effort Start Date	CV (Cost Variance)
Contract Effort Completion Date	% CV
Report Type	SV (Schedule Variance)
Reporting Period End Date (formerly Report Date)	% SV
PM Estimates - Reporting Period End Date	Science & Technology
Government-Contractor Share	Critical Technology Element(s)
System Name	Key Performance Parameter (KPP) URI
System Phase	Key Performance Parameter (KPP) Name(s)
IBR (Integrated Baseline Review) Date	Key Performance Parameter (KPP) - APB Threshold
ECD (Estimated Completion Date) - Contractor	Key Performance Parameter (KPP) - APB Objective
ECD - PM	Key Performance Parameter (KPP) - Actual Measurement
ECD - PM Significant Effort Completed	Key Performance Parameter (KPP) - Actual Measurement Date
ECD - Original PM ECD	Milestone
PAUC (Program Acquisition Unit Cost) - Original APB	Milestone Identifier
APUC (Average Procurement Unit Cost) - Original APB	Milestone Name
PAUC (Program Acquisition Unit Cost) - Current APB	Milestone Estimated Date
APUC (Average Procurement Unit Cost) - Current APB	Milestone Date - Objective
BAC - Contractor (Budget At Completion)	Milestone Date - Threshold
BAC - PM	
BCWP (Budgeted Cost of Work Performed)	



Backup



Defense Acquisition Data Governance: Enabling Acquisition Visibility

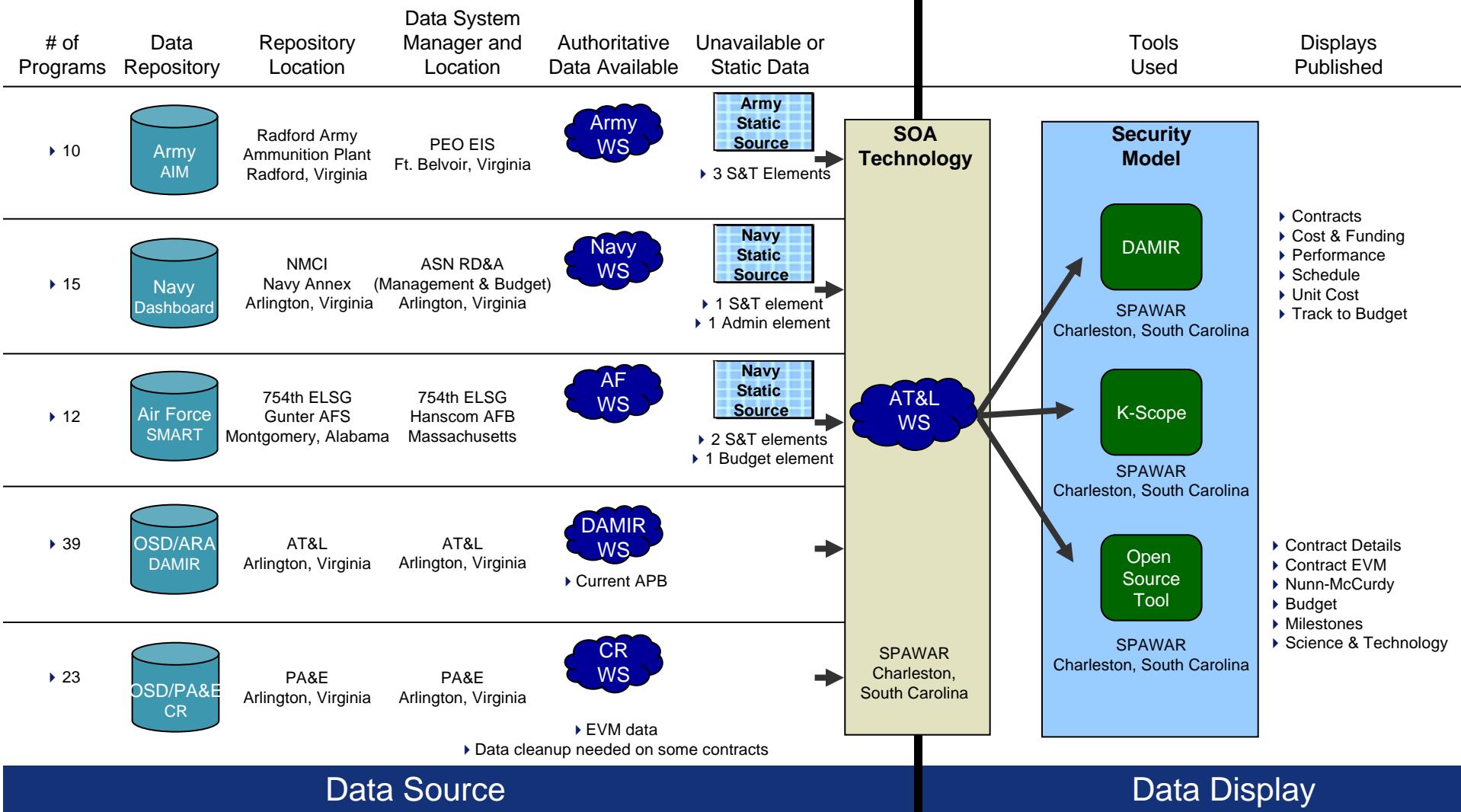
Data Entity Package

- ▶ Acquisition Technology & Logistics created an online tool, the Data Entity Package (DEP), for managing governance of Defense acquisition data
- ▶ For each element—by program—DEP specifies the data definition, authoritative source, individual responsible for maintaining the authoritative copy of that data element
- ▶ DEP is a ‘contract’ between players in the SOA environment
- ▶ Acquisition Technology & Logistics governance organization is the authority for establishing data priorities
- ▶ Having brought a new data element under governance, implementation requires technical integration to be included in the AV SOA

The screenshot shows a web-based application titled "Data Entity Package (DEP) (Prototype)" from the "Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics". The main area is titled "DEP Portal > Entity Responsibility". On the left, there is a tree view of data categories: Contract / Earned Value Data, Contract Header Data, Earned Value (EV) Data, % Complete, % VAC, and Accounting Identity. Under Accounting Identity, several items are listed: ACWP (Actual Cost of Work), BAC - Contractor (Budget At), BAC - PM, BCWP (Budgeted Cost of Work), BCWS (Budgeted Cost of Work), CBB (Contract Budget Base), Ceiling Price - Contractor's Estimate, Ceiling Price - Current, Ceiling Price - Original, Ceiling Price - PM's Estimated Completion Date (when BCW!), Contract Effort Completion Date, Contract Effort Name, Contract Effort Number, Contract Effort Start Date, Current Quantity, Delivered Quantity, EAC - Contractor (Estimate At), EAC - Contractor Best Case, EAC - Contractor Worst Case, EAC - PM, ECD - Original PM ECD, ECD - PM, and ECD - PM Significant Effort. To the right of the tree view is a "Owner Mapping Filter" section with fields for "Restriction Type" (set to "Program"), "Restriction Value" (set to "FCS"), "Source" (set to "Army AIM"), "Owner" (set to "Congress"), and "Update Frequency" (set to "Endpoint URL (Lookup)"). Below this is a "Definition Override" section. At the bottom of the page, there are "Insert" and "Cancel" buttons, and a message stating "No records to display." The status bar at the bottom right says "Ready".



AT&L AV SOA Pilot Architecture





AT&L AV SOA Pilot – Army Programs

PNO#	SERVICE	TITLE	LONG TITLE
182	ARMY	LUH	Light Utility Helicopter
202	ARMY	AB3	Apache Block III
219	ARMY	ATIRCM/CMWS	Advance Threat Infrared Countermeasures / Common Missile Warning System
260	ARMY	GMLRS	Guided Multiple Launch Rocket System
278	ARMY	CH-47F	Cargo Helicopter
294	ARMY	FBCB2	Force XXI Battle Command Brigade and Below Program
299	ARMY	STRYKER	Armored Vehicle
301	ARMY	FCS	Future Combat Systems
341	ARMY	BLACK HAWK UPGRADE (UH-60M)	Utility Helicopter Upgrade Program
346	ARMY	WIN-T INCREMENT 1	Warfighter Information Network
347	ARMY	GCSS ARMY	Global Combat Support System Army
349	ARMY	WIN-T INCREMENT 2	Warfighter Information Network - Tactical Increment 2
350	ARMY	WIN-T INCREMENT 3	Warfighter Information Network - Tactical Increment 3
366	ARMY	EXCALIBUR	Family of Precision, 155mm Projectiles
367	ARMY	HIMARS	High Mobility Artillery Rocket System
372	ARMY	JLENS	Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System
420	ARMY	ER/MP UAS	Extended Range Multi-Purpose Unmanned Aircraft System
531	ARMY	PATRIOT/MEADS CAP	Patriot/Medium Extended Air Defense System Combined Aggregate Program
601	ARMY	BRADLEY UPGRADE	Bradley Fighting Vehicle System Upgrade
746	ARMY	FMTV	Family of Medium Tactical Vehicles
831	ARMY	LONGBOW APACHE	Airframe Modifications on the APACHE Helicopter

Bolded programs
were included in
Pilot Phase 1



AT&L AV SOA Pilot – Navy Programs

PNO#	SERVICE	TITLE	LONG TITLE
101	NAVY	H-1 UPGRADES (4BW/4BN)	United States Marine Corps Mid-Life Upgrade to AH-1W Attack Helicopter and UH-1N Utility Helicopter
161	NAVY	CVN 68	NIMITZ CLASS Nuclear Powered Aircraft Carrier
178	NAVY	TRIDENT II MISSILE	Sea Launched Ballistic Missile
180	NAVY	DDG 51	ARLEIGH BURKE CLASS Guided Missile Destroyer
191	NAVY	MH-60R	Multi-Mission Helicopter Upgrade
197	NAVY	DDG 1000	ZUMWALT CLASS Destroyer
212	NAVY	V-22	OSPREY Joint Advanced Vertical Lift Aircraft
223	NAVY	CVN 78	GERALD R. FORD CLASS Nuclear Aircraft Carrier
238	NAVY	JPALS	Joint Precision Approach and Landing System
247	NAVY	JHSV	Joint High Speed Vessel
253	NAVY	VTUAV	Vertical Takeoff and Land Tactical Unmanned Aerial Vehicle (Fire Scout)
282	NAVY	MH-60S	Multi-Mission Combat Support Helicopter
286	NAVY	RMS	Remote Minehunting System
289	NAVY	TACTICAL TOMAHAWK	Follow-on to TOMAHAWK Baseline missile program
290	NAVY	NMT	Advanced Extremely High Frequency Navy Multiband Terminal Satellite Program
333	NAVY	LHA 6 - AMERICA CLASS	Amphibious Assault Ship
334	NAVY	P-8A	Poseidon Program
345	NAVY	MUOS	Mobile User Objective System
353	NAVY	JOINT MRAP	Joint Mine Resistant Ambush Protected Vehicles
364	NAVY	E-2D AHE	E-2D Advanced Hawkeye
365	NAVY	COBRA JUDY REPLACEMENT	COBRA JUDY REPLACEMENT
368	NAVY	AGM-88E AARGM	AGM-88E Advanced Anti-Radiation Guided Missile (AARGM) Program
373	NAVY	BAMS UAS	Broad Area Maritime Surveillance Unmanned Aircraft System
374	NAVY	LCS	Littoral Combat Ship
378	NAVY	EA-18G	Airborne Electronic Attack Variant of the F/A-18 Aircraft

PNO#	SERVICE	TITLE	LONG TITLE
390	NAVY	CH-53K	Heavy Lift Replacement Program
391	NAVY	SM-6	Standard Missile-6
			Integrated Defensive Electronic Countermeasures
418	NAVY	IDECM	EA-6B Improved Capability (ICAP) III Program
419	NAVY	EA-6B ICAP III	Expeditionary Fighting Vehicle
515	NAVY	EFV	VIRGINIA CLASS submarine
516	NAVY	SSN 774	SAN ANTONIO CLASS Amphibious Transport Dock Ship
542	NAVY	LPD 17	SUPER HORNET Naval Strike Fighter
549	NAVY	F/A-18E/F	Air-to-Air Missile Upgrade
581	NAVY	AIM-9X	Cooperative Engagement Capability
582	NAVY	CEC	LEWIS AND CLARK Class of Auxiliary Dry Cargo Ships
592	NAVY	T-AKE	Joint Standoff Weapon Baseline Variant and Unitary Warhead Variant
766	NAVY	JSOW (BASELINE/UNITARY)	

Bolded programs were included in Pilot Phase 1

Red bolded programs are off the FY2009 MDAP List but being maintained in AVSOA



AT&L AV SOA Pilot – Air Force Programs

PNO#	SERVICE	TITLE	LONG TITLE
166	USAF	NAVSTAR GPS	Global Positioning System
176	USAF	EELV	Evolved Expendable Launch Vehicle
185	USAF	AMRAAM	Advanced Medium Range Air-to-Air Missile
199	USAF	FAB-T	Family of Beyond Line-of-Sight Terminals
			GLOBEMASTER III Advanced Cargo Aircraft Program
200	USAF	C-17A	
210	USAF	SBIRS HIGH	Space-Based Infrared System Program, High Component
220	USAF	C-130J	HERCULES Cargo Aircraft Program
			B-2 Advanced Extremely High Frequency SatCom Capability
224	USAF	B-2 EHF INCREMENT I	
237	USAF	GBS	Global Broadcast Service
			National Polar-Orbiting Operational Environmental Satellite System
239	USAF	NPOESS	
248	USAF	Minuteman III PRP	Minuteman III Propulsion Replacement Program
252	USAF	GLOBAL HAWK (RQ-4A/B)	GLOBAL HAWK (RQ-4A/B)
			Advanced Extremely High Frequency Satellite Program
261	USAF	AEHF	
265	USAF	F-22	RAPTOR Advanced Tactical Fighter
271	USAF	PREDATOR	Unmanned Aircraft System
273	USAF	C-5 AMP	C-5 Aircraft Avionics Modernization Program
277	USAF	AWACS UPGRADE	AWACS Upgrade
292	USAF	GPS-III A	Global Positioning Satellite III
			Multi-Platform Radar Technology Insertion Program
293	USAF	MP RTIP	
298	USAF	C-130 AMP	C-130 Aircraft Avionics Modernization Program
326	USAF	WGS	Wideband Global SATCOM Program
			C-5 Aircraft Reliability Enhancement and Re-engining Program
327	USAF	C-5 RERP	
328	USAF	SBSS B10	Space-Based Space Surveillance Block 10
354	USAF	SDB-I	Small Diameter Bomb Increment I

PNO#	SERVICE	TITLE	LONG TITLE
357	USAF	LAIRCM	Large Aircraft InfraRed CounterMeasures Program
375	USAF	ASIP	Airborne Signals Intelligence Payload Program
376	USAF	B-2 RMP	B-2 Radar Modernization Program
387	USAF	KC-X	Tanker Replacement Program
			Mission Planning System Increments I - III
394	USAF	MPS INCREMENTS I - III	
424	USAF	REAPER	Unmanned Aircraft System
503	USAF	JDAM	Joint Direct Attack Munition
537	USAF	NAS	National Airspace System
555	USAF	JASSM	Joint Air-to-Surface Standoff Missile
560	USAF	JPATS	Joint Primary Aircraft Training System

Bolded programs were included in Pilot Phase 1

Red bolded programs are off the FY2009 MDAP List but being maintained in AVSOA



AT&L AV SOA Pilot – Joint Programs

PNO#	SERVICE	TITLE	LONG TITLE
183	JOINT	JCA	Joint Cargo Aircraft
198	JOINT-USAF	F-35 Lightning II	Joint Strike Fighter (JSF) Program
243	JOINT	CHEM DEMIL-ACWA	Chemical Demilitarization Program - Assembled Chemical Weapons Alternatives
284	JOINT	JTRS NED	Joint Tactical Radio System Network Enterprise Domain
285	JOINT	CHEM DEMIL-CMA	Chemical Demilitarization Program - Chemical Materials Agency Program
360	JOINT	JTRS GMR	Joint Tactical Radio System Ground Mobile Radio
362	JOINT	BMDS	Ballistic Missile Defense System Program
380	JOINT	AMF JTRS	Joint Tactical Radio System Airborne & Maritime/Fixed Station
385	JOINT	JTRS HMS	Joint Tactical Radio System Handheld, Manpack, and Small Form Fit Radios
554	JOINT	MIDS	Multi-Functional Information Distribution System

Bolded programs were included in Pilot Phase 1